

ABSTRACT OF THE DISCLOSURE

The free piston cooler transient temperature control system of the present invention eliminates collisions during the transient cool-down period in a free piston cooler upon start-up. The transient temperature control system incorporates a free piston cooler, having a cold head and a warm end, a cold head temperature sensor, a relational interface, and a temperature controller. The cold head temperature sensor senses the temperature of the cold head and generates a temperature signal. The relational interface is in communication with the temperature signal and contains a predetermined relationship between the cold head temperature and a maximum piston stroke during the transient cool-down temperature range. The relational interface generates a transient range maximum allowable stroke signal from the temperature signal and the predetermined relationship. The temperature controller is in communication with the relational interface and limits the piston stroke during the transient cool-down temperature range to prevent collisions.